UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

July 14, 2011

Mr. Michael J. Erickson SR-6J
Associate Vice President/Principal Engineer
ARCADIS
10559 Citation Drive, Suite 100
Brighton, MI 48116

RE: Area 1: Draft Supplemental Remedial Investigation Report

Dear Mr. Erickson:

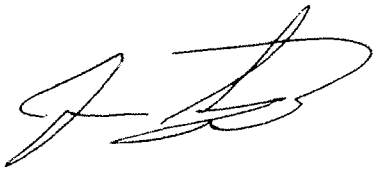
The United States Environmental Protection Agency (EPA) has completed its review of the Area 1 draft Supplemental Remedial Investigation (SRI) Report for the Allied Paper,Inc./Portage Creek/Kalamazoo River Superfund Site.

This draft SRI report focuses on the nature and extent of contamination within Area 1 of the Kalamazoo River from Morrow dam to the former Plainwell dam, and includes portions of Portage Creek from Alcott Street to the confluence of the Kalamazoo River. EPA has several significant issues with this draft SRI report. EPA has provided Georgia-Pacific (GP) with EPA's preliminary draft comments, discussed those issues with GP's representatives via conference calls and at a June 30, 2011 meeting. Enclosed are EPA's comments on the Area 1 draft SRI report.

Therefore, EPA disapproves the draft Area 1 SRI report pending receipt of adequate responses to the enclosed comments and a revised report. The responses to the enclosed comments and revised report must be submitted within (60) sixty days of receipt of this letter.

Please contact me at (312) 886-0992 if you have any questions regarding this matter.

Sincerely,



James A. Saric
Remedial Project Manager
SFD Remedial Response Branch #1

Enclosure

cc: Paul Bucholtz, MDEQ
Garry Griffith, Georgia-Pacific
Richard Gay, Weyerhaeuser

Bcc w/enclosure

Jeff Keiser, CH2MHILL
Leslie Kirby-Miles, ORC
John Canar, SFD
Chuck Roth, SFD

U.S.EPA COMMENTS
ON THE
AREA 1 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SITE

GENERAL COMMENTS

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 1

The data and information presented in the Area 1 SRI Report will be used to develop the feasibility study (FS) for Area 1. As currently written, the conceptual site model (CSM) for Area 1 is not sufficient as the basis for the FS because it does not integrate all of the important findings related to site characteristics, PCB sources, the nature and extent of contamination, PCB fate and transport, and human health and ecological risks. The refined CSM for Area 1 that is presented in Section 10 of the report should also include (1) a description of the exposure pathways and human health and ecological risks; (2) the nature and extent of contamination in terms of concentration rather than mass; (2) an assessment of regional background levels of PCBs that might be expected in the long term in the absence of paper mill-related sources of PCBs; and (3) a sediment stability assessment.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 2

Data and information about the nature and extent of contamination should be presented in a manner that facilitates the identification of areas that (1) may be contributing to unacceptable human health and ecological risks, or could pose a risk in the future, and (2) could serve as ongoing secondary sources of PCBs to downstream areas. To this end, maps showing the spatial distribution of surface sediment and core maximum PCB concentrations are useful. Appendix L provides these maps for the Kalamazoo River channel samples, analogous maps should be provided for Portage Creek and for floodplain soils. Floodplain soil sample results should be displayed on the same maps as the river channel samples. In addition, surface-weighted average concentrations should be averaged over areas that are relevant from an exposure standpoint.

Other data presentations such as percent of samples with PCB concentrations < 1 mg/kg and > 50 mg/kg, summary statistics (especially in cases where results are pooled over large areas), and PCB mass and volume inventories should be de-emphasized because they are less useful for integrating nature and extent and risk assessment results and identifying areas that may need to be addressed in the FS.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 3

The following statements are included in several places in the SRI report: "The SRI data . . . have not substantially changed the overall understanding of Area 1 based on the preceding years of study and the extensive database from the initial RI" and "The additional sampling has also not altered the understanding of the relative importance of Area 1 compared to downstream areas of the Superfund Site." The first statement is an opinion and should be deleted from the SRI report. The second statement is premature because the SRI report does not compare or evaluate PCB concentrations and risk in each area of the Superfund Site.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 4

The discussion of secondary PCB sources and their potential for remobilization via channel migration is incomplete in the report. These sources that require discussion include floodplain soils in the former Plainwell Impoundment and Plainwell #2 Dam and PCB-containing bank soils outside of these areas.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 5

The nature and extent of contamination in Section 8 of the river (the former Plainwell Impoundment) is not evaluated in the report. Although post-TCRA conditions are referenced in Sections 7 and 10, an evaluation of residual contamination needs to be incorporated into the nature and extent of contamination discussion in Section 6.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 6

The SRI report only discusses PCB contamination. The sampling results for contaminants other than PCBs must be summarized and discussed in the SRI report. Further, the SRI report references that PCBs are the primary contaminant of concern. There is no information in the SRI report to support such a conclusion. A thorough discussion of the nature and extent of constituents other than PCBs (including dioxin) needs to be included. Further, a complete analysis of the "other constituents" besides PCBs needs to be included to support the conclusion that PCBs are the primary contaminant of concern.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 7

The information presented in the SRI report is insufficient to evaluate the conclusions that flooding has not transported significant amounts of PCBs to the floodplain, and that floodplain soil samples have "low concentrations similar to those observed in portions of the Site with more traditional floodplains that have varying elevations and are subject to less frequent inundation." In addition, the report should include a map that shows the 100-year floodplain for Area 1.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 8

The report should include a table that clearly identifies all of the data sets that were used in the SRI data analyses. The descriptions of data sets identified in Table 2-1 do not exactly correspond to the descriptions of the data sets identified in Table 3-1, and data sets described in Section 4 that were used in the RI data analysis are not included in either table. Section 6 should include a table that clearly indicates which data sets were used in each type of analysis. As written, it is not clear whether all of the relevant data sets were used.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 9

The report consistently points out that some of the data were collected using an unbiased sampling design while others are based on a biased sampling design, and implies that data collecting using a biased approach are less useful. Explain the significance of this observation and describe if and how it influenced the data evaluation approach.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 10

Despite the acknowledged importance of sediment transport in the fate and transport of PCBs and the evidence of channel migration in Area 1, sediment transport processes are not discussed or evaluated in the report. Include an evaluation of sediment stability and sediment transport as part of the contaminant transport analysis in Section 7.

Commenting Organization: EPA **Commenter: White**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 11

The SRI report identifies a number of other, non-paper mill related sources of PCBs to the Kalamazoo River and watershed. The report should include a more rigorous

evaluation of background conditions including location, and concentrations in surface water, sediment, floodplain soil and fish. What are the uncertainties associated with the background estimates?

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 12

The April 2011 draft of the Baseline Ecological Risk Assessment (BERA) for Area 1 does not present the risk conclusions in a balanced and transparent manner based on the available technical information, and presents the biased conclusion that unacceptable risk to high sensitivity avian species is not relevant at the site.

During development of the toxicity reference values (TRVs) for the BERA, the TRV work group agreed to select two TRVs for avian species representing a range of potential sensitivities to bound risk estimates and inform risk management decisions. Subsequently, Georgia Pacific and its consultant Arcadis, introduced the research led by Dr. Sean Kennedy on the relative sensitivity of avian species to the effects of dioxin-like compounds based on sequence variation of the Ah receptor gene. The TRV group has discussed this work and agrees that it is relevant to the site and should be considered in the BERA. However, no formal agreement was made on how the information should be included in the BERA. The draft BERA uses Dr. Kennedy's work to dismiss the risk estimates based on the agreed upon TRV for high sensitivity species because the indicator species used in the BERA are considered to have moderate sensitivity based on their Ah receptor type. We agree with the conclusion that there does not appear to be unacceptable risk for moderate sensitivity species. However, for the following reasons we do not agree with the conclusion that the previously agreed upon TRV for high sensitivity species should not be considered.

1. The Assessment Endpoints identify broad feeding guilds for avian receptors, including carnivorous, insectivorous, and vermivorous species. Indicator species were selected to represent those groups in the risk calculations. Those indicator species do not represent all possible species in that guild that use the site.
2. The gene sequencing work of Kennedy et al., indicates that the American robin and woodcock (indicators for vermivorous species) and the House Wren (indicator for insectivorous species) fall in the mid-sensitivity Ah receptor type. However, other insectivorous species such as the European starling and the grey catbird, both found at the site, are classified as sensitive species based their Ah receptor type.
3. Not all species potentially present at the site have been sequenced. Therefore it is possible that additional high sensitivity species exist at the site.

Although the avian sensitivity work of Kennedy et al. provides strong evidence that the Ah receptor sequence variation is directly related to the sensitivity of avian species to dioxin-like effects, it is important to recognize that whole organism (or even egg injection) toxicity tests have yet to be conducted with most of the species that have been sequenced. In addition, Dr. Kennedy's research indicates that variation exists in species-specific relative potencies of dioxin and furan congeners, and the toxicity of the dioxin-like PCB congeners has not been specifically tested in the context of the Ah receptor sequence model.

Based on the reasons above and the fact that goal is to assess risk to the feeding guild not to an individual species, for example the robin, EPA disagrees with the conclusions drawn in the BERA. For a balanced and transparent document the risk conclusions should be presented as follows:

Insectivorous Birds

- Moderate sensitivity species such as the House Wren
    - No unacceptable risk exists in Area 1;
        - Data exist to support sensitivity: Based on Ah receptor data, many moderate sensitivity species in this guild are present at the site
- High sensitivity species such as the starling and catbird
    - Unacceptable risk exists in some portion(s) of Area 1;
    - Data exist to support sensitivity: Based on Ah receptor data, at least two high sensitivity species in this guild are present at the site

Vermivorous Species

- Mid-sensitive species such as the robin and woodcock
    - No unacceptable risk exists in Area 1;
    - Data exist to support sensitivity: Based on Ah receptor data, at least two moderate sensitivity species in this guild are present at the site
- High sensitivity species
    - Unacceptable risk may exist in Area 1;
    - To date no high sensitivity species have been identified at the site based on the available Ah receptor sequence data.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 13

The risk conclusions section must be re-written to provide a more detailed analysis and presentation of available information in the following areas:

- Range of risk estimates based on previously agreed upon toxicity reference values. (See comment 14)
- Relationships between estimated risks and areas of exposure at each site. (See comment 15)
- Risk characterization; specifically, estimates of population sustainability based on the minimum viable population size and number of individuals potentially impacted. (See comment 16)

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 14

Range of risk estimates based on previously agreed upon toxicity reference values

- The TRV work group agreed to select two TRVs for avian species that represent a range of potential sensitivities to bound risk estimates and inform risk management decisions. The risk to each avian feeding guild should be fully characterized using both TRVs. For example, data indicating that the robin is only moderately sensitive does not necessarily mean that all vermivorous species will be moderately sensitive. The recent work of Dr. Kennedy does not eliminate the potential for sensitive species to exist within these feeding guilds, and should not be used to neglect characterization of risk to sensitive species. The portions of the risk conclusion section addressing insectivorous and vermivorous birds should be re-written to present the following conclusions:
    - Insectivorous Birds
        - Moderate sensitivity species such as the House Wren
            - No unacceptable risk exists in Area 1;
            - Data exist to support sensitivity: Based on Ah receptor data, many moderate sensitivity species in this guild are present at the site
        - High sensitivity species such as the starling and catbird
            - Unacceptable risk exists in some portion(s) of Area 1;

- Data exist to support sensitivity: Based on Ah receptor data, at least two high sensitivity species in this guild are present at the site

- Vermivorous Species
  - Mid-sensitive species such as the robin and woodcock
    - No unacceptable risk exists in Area 1;
    - Data exist to support sensitivity: Based on Ah receptor data, at least two moderate sensitivity species in this guild are present at the site
  - High sensitivity species
    - Unacceptable risk may exist in Area 1;
    - To date no high sensitivity species have been identified at the site based on the available Ah receptor sequence data.

- Dr. Kennedy's research should be used as additional information to describe the potential types or numbers of species within each feeding guild that would likely be highly and moderately sensitive.
- If practical, Dr. Kennedy's research should be used to show, either semi-quantitatively or qualitatively, the relative scale of sensitivity of the avian species within and across sensitivity categories.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 15

Relationships between estimated risks and areas of exposure at each site

The moving window approach appears to be a very effective method for evaluating the sediment concentrations in the context of exposure for specific receptors with various home ranges. However, the following points must be considered:

- Home ranges that included a portion of the river were smaller than those that did not because where home ranges included the river, points over the water were eliminated. This approach doesn't make sense from a biological perspective, and it may underestimate the average concentration of receptors living near the water's edge. A receptor living near the edge of the river would not be expected to have a truncated home range, but it might use a non-circular or ovalized home range that encompasses more of the shoreline. This non-circular home range could result in an increased overall exposure.

- It would be useful to show in the ERA the frequency distributions presented in Attachment 2 Figure 4-1 through 4-4, with selected effects concentrations (TRVs) for relevant receptors indicated on the x-axis. This would be an effective method to display the magnitude and frequency of exceedances of TRVs based on moderate and high sensitivity categories, and could be informative in the context of Dr. Kennedy's species relative sensitivity research.
- The figures such as B6-3 and B6-12 are difficult to interpret because they display the concentration at the center of the home range, and do not provide information on where exposure occurs within each home range. A more transparent and informative way to display areas where receptor home ranges have average concentrations exceeding TRVs would be to use a Figure B4-6 as a base figure (showing interpolated sediment concentrations) and display a boundary line that captures the collective outer bound of all (circular) home ranges in which the average concentration exceeds a TRV. This would put the total area of exposure with unacceptable risk for a given receptor into a spatial perspective overlaid on the interpolated sediment concentrations.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 16

Additional lines of evidence; for example, estimates of number of individuals potentially impacted

Inclusion of the minimum viable population (MVP) estimate as a line of evidence must be removed, and the estimates of the number of each receptor species present, which were inaccurate, should be removed or substantially refocused.

The argument presented in Section 6.2.4.10, Paragraph 3, is that the MVP approach can be used to discount adverse effects on receptors because the number of adversely affected animals living within the assessment area is a small portion of the estimated minimum viable population. For example, the following argument is presented in 6.1.4: if only 1% of 89 shrew home ranges exceed the NOAEL, and if a calculated MVP for shrews is 350, then less than 1 pair of shrews would be affected, and 1 pair of 350 is not relevant to population sustainability. We note the following:

- The estimates of the number of individuals present in Area 1 are substantial underestimates:
    - The number of short-tailed shrews expected to be present was based on the assumption that shrew density would be equal to one pair per acre (i.e. one pair per average home range). However, data for the

short-tailed shrew presented in the USEPA Wildlife Exposure Factors Handbook indicate peak shrew densities of up to 45 individuals per hectare (18 per acre), with an average across multiple habitat types of 12.9 individuals per hectare (about 5 per acre). Based on the acreage presented in the BERA and a density of 12.9 individuals per acre, the Former Plainwell Impoundment (59 acres) and Plainwell No. 2 Dam Area (89 acres) could contain 310 and 464 short-tailed shrews, respectively. Based on the peak density estimates, there could be 1080 and 1656 short-tailed shrews in each area, respectively.

  - The number of woodcocks potentially present on the site was also estimated in the BERA using the assumption that there would be one pair per home range (11 acres). Data in the USEPA Wildlife Exposure Factors Handbook indicate that 19 to 25 individuals per hectare may be present in some areas.

- The number of individuals of a receptor species that could potentially inhabit the assessment areas is not a measurement endpoint, and must not be a primary line of evidence in the ecological risk assessment. The specific receptor species (e.g. the short tailed shrew) are surrogates for a guild of species potentially present at the site (e.g. vermivorous mammals, including masked, least, short tailed shrews, and various species of moles), with similar dietary preferences but varied densities, home ranges, and population demographics. The focus of the ecological risk assessment must be on whether the contaminants at the site cause adverse effects that reduce the sustainability of populations inhabiting the site.

- The application of the minimum viable population (MVP) is inappropriate and misused in the BERA. EPA disagrees with the approach of defining population sustainability relative to a generalized estimate of MVP, particularly where that MVP is not limited to individuals inhabiting the site. EPA defines a population as, "a group of interbreeding organisms occupying a particular space; the number of humans or other living creatures in a designated area." (http://www.epa.gov/OCEPATERMS/pterms.html) The standard practice in ecological risk assessment is to evaluate the sustainability of a population that inhabits the site of interest. In contrast, the definition presented in the BERA implies that as long as the area surrounding a contaminated site supports the requisite MVP, then it would be acceptable for the site to be 100% lethal to any individuals present. The use of the MVP must be removed from the risk characterization.

Commenting Organization: EPA **Commenter: Keiser**
Section: NA **Page #: NA** **Lines #: NA**
General Comment #: 16

The Area 1 SRI report should incorporate the Michigan Department of Environmental Quality BERA, April, 2003 results in the evaluation of ecological risk.

SPECIFIC COMMENTS

Commenting Organization: EPA **Commenter: White**
Section: 1 **Page #: 1-1 and Figure 1-1** **Lines #: NA**
Specific Comment #: 1

In the second and third bullets and in Figure 1-1, please precede Plainwell Dam with "former."

Commenting Organization: EPA **Commenter: White**
Section: 1 **Page #: 1-2** **Lines #: NA**
Specific Comment #: 2

". . . . to address one of the last ongoing sources of PCBs to the Kalamazoo River . . ." The word "last" should be deleted from this sentence. The report does not include an assessment of the relative magnitude of potential ongoing secondary sources of PCBs to the river that supports the stated conclusion.

Commenting Organization: EPA **Commenter: White**
Section: 1 **Page #: 1-2 and Figure 1-1** **Lines #: NA**
Specific Comment #: 3

Add labels to Figure 1-1 or a new figure to Section 1 that shows the locations of the four other operable units and the former paper mill properties referenced in the third paragraph. The Crown Vantage landfill should also be included because it is a potential source of PCBs to the river.

Commenting Organization: EPA **Commenter: White**
Section: 1.2 **Page #: 1-4** **Lines #: NA**
Specific Comment #: 4

Amend footnote 3 to indicate that MDEQ merged with MDNRE in 2010.

Commenting Organization: EPA **Commenter: White**
Section: 2 **Page #: NA** **Lines #: NA**
General Comment #: 5

A description of PCB analysis and reporting should be added to Section 2 of the SRI report (i.e., samples were analyzed for PCB Aroclors; PCB concentrations are reported as the sum of the detected Aroclor concentrations; treatment of non-detected concentrations in the calculation of summary statistics, surface-weighted average concentrations, and other data analyses).

Commenting Organization: EPA **Commenter: White**
Section: 2 **Page #: Figure 2-1** **Lines #: NA**
Specific Comment #: 6

Insert the word "Former" before "Plainwell Dam" in the figure title. Please delineate the approximate area that is considered the former Plainwell impoundment. Also, correct the symbol for the river mile marker in the legend.

Commenting Organization: EPA **Commenter: White**
Section: 2.2 **Page #: 2-4** **Lines #: NA**
Specific Comment #: 7

"A partial list of past response actions to control sources . . . " The full list of response actions should be provided.

Commenting Organization: EPA **Commenter: White**
Section: 2.2 **Page #: 2-4** **Lines #: NA**
Specific Comment #: 8

The potential for recontamination of areas where remedial actions have been or may be performed should be assessed.

Commenting Organization: EPA **Commenter: White**
Section: 2.3 **Page #: 2-7** **Lines #: NA**
Specific Comment #: 9

Conclude the discussion of other sources of PCBs by noting that PCBs cannot be completely eliminated from the river because of these sources.

Commenting Organization: EPA **Commenter: White**
Section: 2.3.2 **Page #: 2-8** **Lines #: NA**
Specific Comment #: 10

"Among these is the Panelyte site, a property with documented PCB soil . . . " Insert the word "contaminated" between "PCB" and "soil." In addition, provide a reference for the statement " . . . there are dozens of facilities where PCBs (and many other contaminants) are known to have been purchased, used, spilled, or discharged."

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 2.6 **Page #: 2-8** **Lines #: 2&3**
Specific Comment #: 11

As discussed at the June 30, 2011 meeting, the weight-of-evidence approach would benefit from a more formal set of criteria to assess the strength of the evidence. For each line of evidence, at a minimum, the following should be discussed:

- Strength of relationship to the assessment endpoint
- Strength or weakness of the data or information

- Relevance to the Kalamazoo River

Commenting Organization: EPA **Commenter: White**
Section: 3 **Page #: 3-1** **Lines #: NA**
Specific Comment #: 12

First bullet - identify which mills are the "Georgia-Pacific mills in Kalamazoo."

Commenting Organization: EPA **Commenter: White**
Section: 3 **Page #: 3-2** **Lines #: NA**
Specific Comment #: 13

"Post-construction near-shore surface sediment sampling in the former Plainwell Impoundment for potential use in the assessment of residual risks for in-stream sediments" - is this assessment currently planned?

Commenting Organization: EPA **Commenter: White**
Section: 3 **Page #: Table 3-1** **Lines #: NA**
Specific Comment #: 14

The title of this table should be revised to indicate that it summarizes the samples from previous investigations as well.

Commenting Organization: EPA **Commenter: White**
Section: 3.1.1 **Page #: 3-4** **Lines #: NA**
Specific Comment #: 15

"Any classification method requires some subjectivity . . . " The word "field" should be inserted before "classification."

Commenting Organization: EPA **Commenter: White**
Section: 3.8.2 **Page #: 3-15** **Lines #: NA**
Specific Comment #: 16

In the first paragraph, please clarify whether these locations were planned or actual (or both). This paragraph describes 61 locations (29+10+17+5), but the following paragraph describes collection of cores from 44 locations.

Commenting Organization: EPA **Commenter: White**
Section: 3.9.1 **Page #: 3-15** **Lines #: NA**
Specific Comment #: 17

The soils in the in the area historically inundated by the Plainwell #2 dam are referred to as "floodplain soils." However, footnote 4 on page 1-4 indicates that sediments exposed as a result of water levels dropping when dams were opened or partially removed are referred to as exposed sediments. Why are the Plainwell #2 dam area soils considered floodplain soils rather than exposed sediments?

Commenting Organization: EPA **Commenter: White**
Section: 3.9.1 **Page #: 3-16** **Lines #: NA**
Specific Comment #: 18

The base maps for Figures 3-13A and 3-13B are not readable. In addition, the location of the left diversion structure and the areas shown in Figures 3-13A and 3-13B should be clearly shown on Figure 3-12.

Commenting Organization: EPA **Commenter: White**
Section: 3.10 and 3.11 **Page #: 3-17** **Lines #: NA**
Specific Comment #: 19

Please describe the scope of the post-TCRA investigations in Section 3 and report the results in Section 6 (in the same manner as the other SRI activities).

Commenting Organization: EPA **Commenter: White**
Section: 3.10.2.1 **Page #: 3-19** **Lines #: NA**
Specific Comment #: 20

The results of the post-construction near-shore surface sediment sampling in the former Plainwell impoundment should be moved to Section 6 because they provide the best estimate of the current nature and extent of contamination in the impoundment. The map showing the sample locations (Figure 3-15) can remain in Section 3, but the map of results should be moved to Section 6. In addition, the results for the entire reach should be added to Figure L-17 (currently, only the results upstream of RM 55.75 are shown in Figure L-17).

Commenting Organization: EPA **Commenter: White**
Section: 3.10.3 **Page #: 3-20** **Lines #: NA**
Specific Comment #: 21

Please clarify whether the monitoring locations were upstream or downstream of the work limits (rather than using the word "from"). Show the location of the 10th Street Bridge on a map, and reference the map.

Commenting Organization: EPA **Commenter: White**
Section: 3.10.4 **Page #: 3-23** **Lines #: NA**
Specific Comment #:

First line - replace the phrase "lack of overlap" to read "minimal overlap."

Commenting Organization: EPA **Commenter: White**
Section: 3.10.4 **Page #: 3-23** **Lines #: NA**
Specific Comment #: 22

"The middle graph in Figure 3-18 shows little correlation between total PCB concentration and fish length." Based on visual inspection, there does appear to be a correlation, although it is weaker than the relationships shown in the top and

bottom panels. Please report the correlation coefficient and significance for each panel.

Commenting Organization: EPA **Commenter: White**
Section: 3.10.4 **Page #: 3-23** **Lines #: NA**
Specific Comment #: 23

The square of the correlation coefficient is the ratio of cross-product variance to the total variance. Therefore, the proportion of variance accounted for is approximately 69%, not the stated 83%.

Commenting Organization: EPA **Commenter: White**
Section: 3.10.5 **Page #: 3-23** **Lines #: NA**
Specific Comment #: 24

"The mid-channel area was defined . . . as the area located at least 40 feet outward from the top-of-bank." Clarify this description - does this mean the central part of the channel more than 40 feet from either bank?

Commenting Organization: EPA **Commenter: White**
Section: 3.11.3 **Page #: 3-27** **Lines #: NA**
Specific Comment #: 25

Are the confirmation sample results for the Plainwell #2 Dam area included in the nature and extent evaluation in Section 6, and on the PCB distribution maps in Appendix L? If not, please add.

Commenting Organization: EPA **Commenter: White**
Section: 4.2.3 and 6.1 **Page #: 4-3 and footnote 8, page 6-2** **Lines #: NA**
Specific Comment #: 26

It is not clear why the MDEQ 2008 soil and sediment data from the former Plainwell impoundment are not included in the nature and extent evaluation in Section 6, particularly since they represent post-TCRA conditions. Other data sets used in the RI data evaluation were based on a biased sampling approach, so the data should not be excluded solely on this basis. Any uncertainties that can be attributed to the sampling design can be described as part of the description of nature and extent.

Commenting Organization: EPA **Commenter: White**
Section: 5 **Page #: 5-2, Table 5-3** **Lines #: NA**
Specific Comment #: 27

"[Tables 5-2 and 5-3] show the river mile positions and length of river reaches that are defined by locations of bridges, dams, and the confluence with Portage Creek, as well as points of transition in slope and water depth." Add references to figures (maps) that show the features referenced in Tables 5-2 and 5-3.

Commenting Organization: EPA **Commenter: White**
Section: 5 **Page #: Table 5-3** **Lines #: NA**
Specific Comment #: 28

Please add the river reach number (1 through 4). The average sediment thicknesses shown for Reaches 3 and 4 are not the same as the thicknesses shown on Figure I1-3 (the figure shows average thicknesses of 4.0 and 3.0 feet in Reaches 3 and 4, respectively).

Commenting Organization: EPA **Commenter: White**
Section: 5 **Page #: 5-3** **Lines #: NA**
Specific Comment #: 29

"Upstream of Plainwell No. 2 Dam Area, the river channel is predominately an erosional environment . . ." If this was the case, then the sediment thickness would be very thin or absent. Is this reach of the river in dynamic equilibrium?

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 5.2.2.1 **Page #: 5-2** **Lines #: 2&3**
Specific Comment #: 30

Change "derived" to "selected." Make the change in all subsequent TRV related sections.

Commenting Organization: EPA **Commenter: White**
Section: 5.4.1 **Page #: 5-13** **Lines #: NA**
Specific Comment #: 31

"Only the segment from D Avenue to the Railroad Bridge has a lower average sediment thickness." Please add the location of the Railroad Bridge to Figure 5-3 if it is not already shown (the labels are hard to read).

Commenting Organization: EPA **Commenter: White**
Section: 5.5 **Page #: 5-18** **Lines #: NA**
Specific Comment #: 32

". . . where the flood-prone width is approximately the width at which the water level is twice the maximum depth and the bankfull width is the width corresponding to the maximum water level." Please add a diagram to illustrate what this means.

Commenting Organization: EPA **Commenter: White**
Section: 5.5 **Page #: 5-19** **Lines #: NA**
Specific Comment #: 33

A map showing the locations and limits of the various geomorphic channel types would be useful.

Commenting Organization: EPA **Commenter: White**
Section: 5.6 **Page #: 5-20** **Lines #: NA**
Specific Comment #: 34

"Topography adjacent to the river varies, range from an incised valley with narrow floodplains in the upper reaches of the Site . . ." Add a figure showing the extent of the 100 year floodplain in Area 1.

Commenting Organization: EPA **Commenter: White**
Section: 6 **Page #: NA** **Lines #: NA**
General Comment #: 35

In Section 6 and elsewhere in the report, the text cites a number of key figures in Appendix I to support the discussion. Please include any table or figure that supports an important observation or conclusion in the main document.

Commenting Organization: EPA **Commenter: White**
Section: 6 **Page #: NA** **Lines #: NA**
General Comment #: 36

Section 6 frequently reports sample results as percent of samples with PCB concentrations less than 1 mg/kg and greater than either 10 mg/kg or 50 mg/kg, depending on the area being discussed. Explain the significance of these threshold values.

Commenting Organization: EPA **Commenter: White**
Section: 6 **Page #: 6-1** **Lines #: NA**
Specific Comment #: 37

"While the previous RI report was not approved by the State, the results of the SRI sampling efforts have not significantly changed the understanding of the nature and extent of contamination in Area 1 developed from review and analysis of the data collected prior to 2007." This statement should be deleted because it states an opinion.

Commenting Organization: EPA **Commenter: White**
Section: 6.1 **Page #: 6-2** **Lines #: NA**
Specific Comment #: 38

The data used to characterize the nature and extent of PCBs in sediments and soils throughout Area 1 should be all inclusive, unless the data represent an area that was remediated as part of the TCRAs. The first bullet on page 6-2, in combination with the second bullet, implies that data from specific geographic areas or geomorphic features were not used in the assessment of nature and extent because they "may or may not be applicable to the river reach as a whole." Please clarify the meaning of this statement, and state whether any data sets were excluded from the evaluation of nature and extent of PCBs in Area 1 "as a whole." and why. The third bullet implies

that data collected to evaluate the effects of the TCRAs is not (and cannot) be used to describe the nature and extent of contamination under post-TCRA conditions. These data can be used to evaluate current conditions, while acknowledging that the river channel is adjusting to the restoration of free-flowing conditions.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6 **Page #: 6-2 & 6-3** **Lines #: NA**
Specific Comment #: 39

The text, starting with the second paragraph, presenting the research on the AHR receptor type and sensitivity should be moved to the effects assessment (Section 5). In addition, as discussed in the general comments. Text should be added to the effects assessment section to clarify the ecological relevance of selecting a high sensitivity and a mid range sensitivity TRV. At a minimum the text should acknowledge the following:

1. The Assessment Endpoints identify broad feeding guilds for avian receptors, including carnivorous, insectivorous, and vermivorous species. Indicator species were selected to represent those groups in the risk calculations. Those indicator species do not represent all possible species in that guild that use the site.

2. The gene sequencing work of Kennedy et al., indicates that the American robin and woodcock (indicators for vermivorous species) and the House Wren (indicator for insectivorous species) fall in the mid-sensitivity Ah receptor type. However, other insectivorous species such as the European starling and the grey catbird, both found at the site, are classified as sensitive species based their Ah receptor type.

3. The high sensitivity TRV is applicable to sensitive species in a guild known to be at the site or those species that use the site but may be of the sensitive AH receptor type.

In addition, the high sensitivity and mid-sensitivity TRVs should not be treated as separate lines of evidence in the risk characterization. They are bounds on the estimated risk to a receptor group using the HQ approach. It is appropriate to discuss the relative uncertainties of the two TRVs in the uncertainty section.

Commenting Organization: EPA **Commenter: White**
Section: 6.1 **Page #: 6-3** **Lines #: NA**
Specific Comment #: 40

"Surface and core maximum PCB results for sediment in Area 1 are presented in Appendix L." Please confirm that these maps display sample results from all investigations, and that no data are excluded except for samples that were collected in areas that were remediated as part of the TCRAs.

Commenting Organization: EPA **Commenter: White**
Section: 6.2 **Page #: 6-4** **Lines #: NA**
Specific Comment #: 41

"The use of all available data, including the historical RI data collected 16 years ago, may provide a conservative representation of PCB concentrations relative to actual present day conditions, particularly with respect to surface sediment PCB levels." Please revise this sentence to indicate that using data that spans a range of 16 years introduces some uncertainty into the evaluation of nature and extent because river conditions are dynamic. Resampling of surface sediment at over 50 locations showed that concentrations have not declined significantly over time.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.1 **Page #: 6-5** **Lines #: NA**
Specific Comment #: 42

"Fine and coarse sediment in surficial sediment samples exhibited lower PCB concentrations in 2008 than in 1993/1994 . . ." Please state whether or not the difference is statistically significant.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.1 **Page #: 6-5** **Lines #: NA**
Specific Comment #: 43

In the first paragraph, please clarify whether these locations were planned or actual (or both). This paragraph describes 61 locations (29+10+17+5), but the following paragraph describes collection of cores from 44 locations.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.1 **Page #: 6-5** **Lines #: NA**
Specific Comment #: 44

Spatial distribution of PCBs in Portage Creek - this section references Figure 6-1, which shows the PCB distribution in the Kalamazoo River. This figure should be the same as Figure I1-10a included in Appendix I1. Also, the location of Upjohn Park should be noted on the Portage Creek figure.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.1 **Page #: 6-5** **Lines #: NA**
Specific Comment #: 45

Spatial distribution of PCBs in Portage Creek - the RI report should include (and this section should reference) map(s) similar to those in Appendix L that show surface and core maximum PCB concentrations.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.1 **Page #: 6-5** **Lines #: NA**
Specific Comment #: 46

" . . . deepest observed sediment deposits" and "sediment in this area is up to 9 feet deep." Please replace "deep" with "thick."

Commenting Organization: EPA **Commenter: White**
Section: 6.2.1 and I-1 **Page #: 6-5 and App. I1 page 4-3** **Lines #: NA**
Specific Comment #: 47

"In general, PCB concentrations in surface sediments tend to increase from upstream to downstream . . . this pattern of increasing PCB concentration with distance downstream of Alcott Street is exemplified by the [SWAC] for PCBs." Although the SWAC increases in a downstream direction, Section 3 is much longer than the other sections. Therefore, the substantially higher surface sediment concentrations in between miles 1.1 and 1.3 are not apparent in the SWAC. The substantially higher concentrations between miles 1.1 and 1.3 are an obvious exception to the overall trend and should be noted.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.1 **Page #: 6-6** **Lines #: NA**
Specific Comment #: 48

"Section 4 has the lowest bed slope (0.1 feet/mile) and the highest average sediment thickness (3.0 feet) in the study area." According to Appendix I2, Reach 3 has the lowest slope (0.07%) and highest average sediment thickness (4.0 feet). Also, 0.1 feet/mile should be 0.1 percent.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.1 **Page #: 6-6** **Lines #: NA**
Specific Comment #: 49

"Sediment PCB SWACs in the lower-gradient downstream sections of Portage Creek are higher than in any section of the Kalamazoo River in Area 1." The SWACs for Portage Creek are calculated over areas of 0.5 to 3.8 acres. The Kalamazoo River SWACs are calculated over a much larger area (24 to 130 acres) and are therefore not directly comparable.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.1 **Page #: 6-7** **Lines #: NA**
Specific Comment #: 50

" . . .the distribution of PCBs in Portage Creek reflects locations of significant fine-grained sediment accumulation, particularly behind bridges and in very slow-moving areas." PCB concentrations in areas behind bridges are not specifically discussed in the data presentation. Maps showing the spatial distribution of PCB concentrations would help the reader evaluate this conclusion. Additionally, Figure

I1-10d shows that relatively few samples can be classified as "fine-grained" (i.e., >50% silt and clay based on laboratory grain size data). This conclusion should be restated to emphasize that PCBs tend to accumulate in the lower-gradient reaches of the stream.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.2.1 **Page #: 6-8** **Lines #: NA**
Specific Comment #: 51

"Using all available data within the main river channel and Plainwell mill race, the nature and extent of PCBs in sediment were evaluated." Please include a table that identifies the specific data sets that were used in the analysis in Section 6.2.2.1, using the same descriptions of the data sets that are listed in Table 3-1.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.2.1 **Page #: 6-9** **Lines #: NA**
Specific Comment #: 52

Add or cite an existing figure that illustrates the eight sections of the river and labels all of the landmarks identified in the bulleted list of the reaches.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.2.1 **Page #: 6-9** **Lines #: NA**
Specific Comment #: 53

As noted in previous comments, Section 8 should not be excluded from the description of the nature and extent of contamination in Area 1. Any data that represent post TCRA conditions should be provided and discussed, along with the qualification that the area is still adjusting to post-restoration conditions.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6.1.2.2 **Page #: 6-9 & 6-10** **Lines #: NA**
Specific Comment #: 54

As discussed in the general comment 5, inclusion of the MVP estimate as a line of evidence must be removed, and the estimates of the number of each receptor species present, which were inaccurate, should be removed or substantially refocused. It is inappropriate to estimate the number of individual in an area based on home range. That assumes that the home ranges do not overlap. Estimates should be based on the density estimates derived from the literature.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.2.1 **Page #: 6-11** **Lines #: NA**
Specific Comment #: 55

"Overall, both fine and coarse surficial sediment samples exhibited higher PCB concentrations in 2007 than the samples collected in 1993/1994, but the distribution

of PCBs in the subsurface sediment was generally similar between sampling events." Please describe the data analyses that were performed to support this observation. Were the higher surficial concentrations in 2007 statistically significant?

Commenting Organization: EPA **Commenter: White**
Section: 6.2.2.1 **Page #: 6-11** **Lines #: NA**
Specific Comment #: 56

"Sediment PCB concentrations are highest in those areas with reduced flow velocities." Sediment PCB concentrations may also be related to proximity to a source, particularly in the Crown Vantage side channel. This paragraph also relates PCB concentration to organic carbon and silt and clay content. Please provide the plots of PCB concentration versus TOC and silt/clay (Figure I2-13) in the main document and evaluate the strength of the association (correlation and significance) between PCB concentration and sediment characteristics.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.2.1 **Page #: 6-11** **Lines #: NA**
Specific Comment #: 57

"Within the . . . depositional areas in proximity to and downstream of the Plainwell #2 Dam, PCB concentrations increase, but are still relatively low . . ." Delete the phrase "but are still relatively low." Visual inspection of the top panel in Figure 6-1 indicates that surface sediment concentrations in this section are elevated to a similar degree as those in the urban Kalamazoo section and Crown Vantage size channel cited earlier in the paragraph.

Commenting Organization: EPA **Commenter: Dillon/Roark**
Section: 6.1.4 **Page #: 6-11 & 6-12** **Lines #: NA**
Specific Comment #: 58

See general comment 5 and specific comment 5.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.2.1 **Page #: 6-12** **Lines #: NA**
Specific Comment #: 59

" . . . PCB concentrations are relatively consistent through the top foot of sediment . . . and [are] generally declining with depth." Please include Figure I2-10a in Section 6 to support this discussion.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.2.2 **Page #: 6-14** **Lines #: NA**
Specific Comment #: 60

This section presents an estimate of the acreage of unsampled potential hot spots in the urban Kalamazoo River reach. However, the logic of the calculation is not

readily apparent and appears to be based on a number of assumptions that are not described and may not be valid. While the presence of unsampled hot spots is an important topic that should be discussed and evaluated in the report, the ability to quantitatively estimate the acreage with a reasonable level of certainty should be reconsidered.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.2.3 **Page #: 6-15** **Lines #: NA**
Specific Comment #: 61

"Consistent with the individual sample concentration results, PCB SWACs were generally low . . . ." This is an over-generalization - not all individual sample concentrations were "low" and SWACs are calculated over large areas that don't reflect the influence of localized hot spots. Please delete this phrase.

Commenting Organization: EPA **Commenter: White**
Section: 6.2.5 **Page #: Table 6-12** **Lines #: NA**
Specific Comment #: 62

Total PCB-containing volumes and masses for Area 1 should not be calculated unless Section 8 is included.

Commenting Organization: EPA **Commenter: White**
Section: 6.3 **Page #: 6-24** **Lines #: NA**
Specific Comment #: 63

Please add maps to Appendix L that show surface and core maximum PCB concentrations in floodplain soil at all locations (the floodplain sample results can be added to the existing maps showing the sediment sample results). The information presented in this section is insufficient to evaluate the conclusions that flooding has not transported significant amounts of PCBs to the floodplain, and that the soil samples have "low concentrations similar to those observed in portions of the Site with more traditional floodplains that have varying elevations and are subject to less frequent inundation."

Commenting Organization: EPA **Commenter: White**
Section: 6.3 **Page #: 6-24** **Lines #: NA**
Specific Comment #: 64

"Conversely, distinctly different characteristics are observed in the former Plainwell Impoundment, where materials in what is now the floodplain are more representative of former sediment than floodplain soil, and were deposited under entirely different circumstances and mechanisms." Please present the data that form the basis for this conclusion.

Commenting Organization: EPA **Commenter: White**
Section: 6.4.1 **Page #: 6-27** **Lines #: NA**
Specific Comment #: 65

"Flow variations . . . had little apparent effect on the total PCB concentration observed." Was seasonality taken into consideration in this analysis – were only samples collected in the same season included?

Commenting Organization: EPA **Commenter: White**
Section: 6.5 **Page #: 6-28** **Lines #: NA**
Specific Comment #: 66

Please include a new figure or cite an existing figure that shows the location and extent of each ABSA.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: 7-1** **Lines #: NA**
Specific Comment #: 67

"Due to the hydrophobicity and consequent high affinity of PCBs for adsorption to natural organic matter, the transport and fate of PCBs in river systems is governed in part by the transport and fate of sediment particles to which PCBs sorb to or partition into." Despite the acknowledged importance of sediment transport in the fate and transport of PCBs, sediment transport processes are not discussed or evaluated in the report. Please include an evaluation of sediment stability and sediment transport in Section 7.

Commenting Organization: EPA **Commenter: White**
Section: 7 **Page #: 7-1** **Lines #: NA**
Specific Comment #: 68

"This association with sediment particles makes sediment a "sink" for PCBs, and to a more limited extent, a reservoir supplying PCBs to the water column and biota within the aquatic ecosystem." Please clarify the meaning of the phrase "to a more limited extent."

Commenting Organization: EPA **Commenter: White**
Section: 7-3 **Page #: 7-3** **Lines #: NA**
Specific Comment #: 69

"With the exception of the most downstream deposit . . . surface sediment PCB concentrations are relatively low and overlay historically-deposited deeper layers with higher PCB concentrations."This statement is not accurate as surface concentrations in at least one other hot spot exceed 50 mg/kg. Please replace the phrase "relatively low" with an accurate and precise description of surface concentrations relative to subsurface concentrations.

Commenting Organization: EPA **Commenter: White**
Section: 7.1 **Page #: 7-3** **Lines #: NA**
Specific Comment #: 70

"These deposits have been present through a period that has included several high flow events." This sentence implies that the hot spot sediment deposits are stable; however, no sediment stability analysis has been performed. Please include a more comprehensive sediment stability analysis to support this statement.

Commenting Organization: EPA **Commenter: White**
Section: 7.1 **Page #: 7-3** **Lines #: NA**
Specific Comment #: 71

"The fate of PCBs in Portage Creek sediments is in part dependent on the stability of the deposits that contain the majority of the PCB mass." Please include an analysis of sediment stability in Portage Creek.

Commenting Organization: EPA **Commenter: White**
Section: 7.2 **Page #: 7-4** **Lines #: NA**
Specific Comment #: 72

Please define what is meant by "Internal" and "External" sources of PCBs. Neither of these categories appears to include paper mill-related sources of PCBs, some of which may not yet be completely controlled.

Commenting Organization: EPA **Commenter: White**
Section: 7.2 **Page #: 7-5** **Lines #: NA**
Specific Comment #: 73

This section (as well as other sections in the report) identifies a number of other, non-paper mill related sources of PCBs to the Kalamazoo watershed. The SRI report should include a more rigorous presentation of background conditions. What are the surface sediment and fish tissue PCB concentrations detected and where were the samples located? What are the uncertainties associated with the background estimates?

Commenting Organization: EPA **Commenter: White**
Section: 7.3 **Page #: 7-5** **Lines #: NA**
Specific Comment #: 74

The analyses of temporal trends of surface water, fish tissue and surface sediment concentrations should be moved to Section 6 and included with the rest of the data analyses.

Commenting Organization: EPA **Commenter: White**
Section: 7.3 **Page #: 7-5** **Lines #: NA**
Specific Comment #: 75

"Data for these media indicate that the transport and bioavailability of PCBs in Area has declined over the period of monitoring." Surface water concentrations near the U.S. 131 Bridge, Plainwell Dam, Alcott Street Bridge and Bryant Street Bridge have not declined over the period of monitoring. Please revise this sentence to be more accurate and precise.

Commenting Organization: EPA **Commenter: White**
Section: 7.3 **Page #: 7-6** **Lines #: NA**
Specific Comment #: 76

"So long as these processes remain active, future rates of attenuation will continue" and "Extrapolation of observed historical declines to future trends is uncertain." These two sentences are contradictory. Please delete the words "rates of" from the first sentence cited above.

Commenting Organization: EPA **Commenter: White**
Section: 7.3.1 **Page #: 7-7** **Lines #: NA**
Specific Comment #: 77

Please provide a more complete description of the impact of detection limits on the temporal analysis of surface water data. What was the frequency of detection in the 1994 surface water data set? (Table 6-20, which is cited in the text, does not provide information about surface water reporting limits).

Commenting Organization: EPA **Commenter: White**
Section: 7.3.1 **Page #: 7-7** **Lines #: NA**
Specific Comment #: 78

The surface water data suggest that surface water PCB concentrations in the vicinity of U.S. 131 Bridge and the former Plainwell Dam have not changed over time. Please identify and evaluate possible explanations for this observation.

Commenting Organization: EPA **Commenter: White**
Section: 7.3.3 **Page #: 7-12** **Lines #: NA**
Specific Comment #: 79

". . . because detected concentrations are close to the reporting limit it is more difficult to identify statistically significant differences." Please provide a more precise description of "close to the reporting limit."

Commenting Organization: EPA **Commenter: White**
Section: 7.3.3 **Page #: 7-12** **Lines #: NA**
Specific Comment #: 80

"These data are consistent with the findings of the geochronological analyses presented in 2000 which showed the surface sediment PCB concentrations approaching an asymptotic level at several locations." The first paragraph in Section 7.3.3 indicated that no geochronological data were collected in Area 1. Please resolve these contradictory statements. If geochronological data are available for Area 1, please discuss them in more detail so that the conclusions in Section 7.3.3 can be evaluated.

Commenting Organization: EPA **Commenter: White**
Section: 7.4 **Page #: 7-12** **Lines #: NA**
Specific Comment #: 81

This section estimates PCB transport based on surface water data for PCBs; however, erosion and deposition of PCB-contaminated sediment are not evaluated. Please expand the PCB transport evaluation to consider PCB-contaminated sediment transport as well (e.g. bedload and near-bed suspended sediment transport).

Commenting Organization: EPA **Commenter: White**
Section: 7.4 **Page #: 7-13** **Lines #: NA**
Specific Comment #: 82

". . . slower water along the south bank in areas with higher PCB concentration may have given rise to these higher concentrations . . . these data potentially cause a high bias in the estimate of PCB transport at the former Plainwell Dam station" and "The apparent increase in PCB load in the river between the U.S. 131 bridge and the former Plainwell Dam . . . may be associated with the high bias in the measurements from the left bank at the former Plainwell Dam." If the surface water samples represent actual site conditions, then why are the data considered to be biased high?

Commenting Organization: EPA **Commenter: White**
Section: 7.4 **Page #: 7-15** **Lines #: NA**
Specific Comment #: 83

"Erosion of this prism could have increased PCB transport during the period 2006-2010." The surface water monitoring performed during the TCRA indicated that TCRA activities "did not result in an increase in solids or PCB loading to the areas downstream" (page 3-26). In addition, the surface water data did not show a declining trend prior to 2006. Other possible explanations for the apparently unchanging surface water concentrations in the reach from U.S. 131 to the Plainwell Dam should be considered and evaluated.

Commenting Organization: EPA **Commenter: White**
Section: 7.5 **Page #: 7-17** **Lines #: NA**
Specific Comment #: 84

"Historically, during periods of inundation and more frequent flooding the impoundments. . . served as significant sinks for PCBs in the Area 1 River system." Please delete the phrase "more frequent" unless there is evidence that flooding was more frequent in the past than it is today.

Commenting Organization: EPA **Commenter: White**
Section: 10 **Page #: 10-1** **Lines #: NA**
Specific Comment #: 85

The introduction to the CSM includes a bulleted list of the specific aspects of the CSM that are included in this section. The CSM should also include (1) a description of the exposure pathways and human health and ecological risks; (2) an assessment of regional background levels of PCBs that might be expected in the long term in the absence of paper mill-related sources of PCBs; and (3) a sediment stability assessment.

Commenting Organization: EPA **Commenter: White**
Section: 10 **Page #: 10-1** **Lines #: NA**
Specific Comment #: 86

"Other aspects of prior risk assessments . . . were not revisited." Although the results of the prior risk assessments were not revisited, they should be summarized in the refined CSM so that the relationship between PCB contamination and risk can be fully evaluated and the refined CSM can be used as the basis for developing remedial action objectives in the FS.

Commenting Organization: EPA **Commenter: White**
Section: 10.1 **Page #: 10-2** **Lines #: NA**
Specific Comment #: 87

A comparison of PCB mass inventory in each area of the river is less useful than comparisons of PCB concentration in each area and estimated risk in each area. Site-wide comparisons based solely on PCB inventory are misleading.

Commenting Organization: EPA **Commenter: White**
Section: 10.1.1 **Page #: 10-2** **Lines #: NA**
Specific Comment #: 88

The fact remains that consumption of fish caught in Area 1 poses an unacceptable risk, and fish in Area 1 have higher PCB levels than reference area fish. People still fish in Area 1, even if there is more fishing activity downstream. The CSM should clearly identify the pathways and receptors that pose unacceptable risk.

Commenting Organization: EPA **Commenter: White**
Section: 10.1.1 **Page #: 10-3** **Lines #: NA**
Specific Comment #: 89

Please move all fish tissue data analysis to Section 6.

Commenting Organization: EPA **Commenter: White**
Section: 10.1.3 **Page #: 10-6** **Lines #: NA**
Specific Comment #: 90

The summary of PCB sources should include mill-related PCB sources, including the ones that are not yet controlled. The Crown Vantage landfill is not identified as a potential source, even though the sediments in this area have high PCB concentrations indicative of proximity to a source and paper-related waste was noted in this area.

Commenting Organization: EPA **Commenter: White**
Section: 10.1.3 **Page #: 10-6** **Lines #: NA**
Specific Comment #: 91

Please amend the discussion of PCB load and transport to include an assessment of sediment transport.

Commenting Organization: EPA **Commenter: White**
Section: 10.2 **Page #: 10-9** **Lines #: NA**
Specific Comment #: 92

"Channel morphology apparently played an important role in the unique formation of the Crown Vantage side channel sediment deposit . . ." This paragraph implies that the PCBs were delivered to the side channel via sediment transport and deposition during high flow events. What is the possibility that the PCBs were derived from a local source (i.e., the Crown Vantage landfill)?

Commenting Organization: EPA **Commenter: White**
Section: 10.2 **Page #: 10-10** **Lines #: NA**
Specific Comment #: 93

"As described in Section 6.3, upstream of the Plainwell No. 2 dam area . . . are predominately at levels below risk-based concentrations or applicable criteria." Floodplain soil data were not compared to risk-based concentrations or applicable criteria in Section 6.3. Please resolve this discrepancy.

Commenting Organization: EPA **Commenter: White**
Section: 10.3 **Page #: 10-10** **Lines #: NA**
Specific Comment #: 94

"These hot spots are stable - their spatial extent and PCB concentrations remained essentially unchanged even after the remnants of Hurricane Ike swept through the Kalamazoo River Valley in 2008." Is this statement supported by data that show the

horizontal and vertical extent of the hot spots before and after Hurricane Ike? Section 3.4 indicates that the hot spot assessment was a one-time sampling event. In addition, a sediment stability assessment should consider multiple lines of evidence - additional information should be presented to support the conclusion that the hot spot sediment deposits are stable.

Commenting Organization: EPA **Commenter: White**
Section: 10.3 **Page #: 10-11** **Lines #: NA**
Specific Comment #: 95

First bullet - "While the estimated SWAC is already relatively low, it may represent a conservative estimate - many of the samples were collected more than 10 years ago . . ." A comparison of the SWAC for the entire reach to the cleanup goal for the TCRA is not sufficient for broadly concluding that PCB concentrations throughout Area 1 are "relatively low" and by implication not significant from a risk perspective. In addition, the analysis of temporal trends in surface sediment concentrations indicates no significant decrease in concentration over time. Therefore, the contention that the Area-wide SWAC is a conservative estimate is not supported by the data and should be deleted.

Commenting Organization: EPA **Commenter: White**
Section: 10.5 **Page #: 10-12** **Lines #: NA**
Specific Comment #: 96

"External PCB sources . . . govern the bioavailability of PCBs to fish." Please precede this sentence with the phrase "Assuming that all mill-related sources of PCBs are controlled . . ."

Commenting Organization: EPA **Commenter: White**
Section: I-1 **Page #: 4-4** **Lines #: NA**
Specific Comment #: 97

"PCB SWACs . . . are higher in Section 4, which has a low slope (0.1 feet/mile) and high average sediment thickness (3.0 feet)." According to Figure I1-3, the slope of Section 4 is 0.1%. Also, this sentence implies that the SWAC is higher in Section 4 because of its low slope and greater average sediment thickness. Section 3 has a lower slope and greater average sediment thickness than Section 4.

Commenting Organization: EPA **Commenter: White**
Section: I-1 **Page #: Figure I1-11** **Lines #: NA**
Specific Comment #: 98

This figure (PCB results versus TOC, percent solids, silt and clay for Portage Creek) should be included in Section 6 of the main report because the strength of the association between PCB concentration and sediment characteristics is an important aspect of the CSM.

Commenting Organization: EPA **Commenter: White**
Section: I-1 **Page #: 6-1** **Lines #: NA**
Specific Comment #: 99

" . . . the distribution of PCBs in Portage Creek is related to the presence of fine-grained sediments with high organic content." Figure I1-11 shows that the relationship between PCB concentration and TOC or percent silt/clay is not particularly strong. Additionally, Figure I1-10d shows that relatively few samples can be classified as "fine-grained" (i.e., >50% silt and clay based on grain size data). This conclusion should be rephrased to be less definitive.

Commenting Organization: EPA **Commenter: White**
Section: I-1 **Page #: 4-2 and 6-1** **Lines #: NA**
Specific Comment #: 100

" As a whole, fine and coarse sediment in surficial sediment exhibited lower PCB concentrations in 2008 than in 1993/1994" and "Surface sediment concentrations as a whole were lower in 2008 samples than those collected in 1993/1994." Is the apparent decrease in concentration statistically significant?

EDITORIAL COMMENTS

Many of the map-based figures (especially in Section 3) need either river mile markers or inset maps showing the location of the river reach shown. As currently presented, the location of the specific reach shown in many of the maps cannot be readily determined. In addition, key features that are frequently cited in the text are not shown on the maps and should be labeled on any map in which they are shown (i.e., Portage Creek, mill race confluence, Plainwell #2 dam, key bridges and roads).

Page 5-3, second paragraph, delete "aprons" or change to "apron"

Page 5-5, last paragraph - should August 1998 be August 1988?

Page 3-25, last paragraph in Section 3.11 - change "conformation" to "confirmation"

Table 3-4 - the column header in right-hand column is cut off.

Page 4-1, first paragraph in Section 4.1.1 - change "ARCADIS received the results of the bathymetric survey" to "ARCADIS reported the results . . ."

Figure 5-3 - many of the labels are unreadable